FBD-12-18

Roll No. : __________

Objective
Paper Code
8191

Intermediate Part Second

MATHEMATICS (Objective)

Time: 30 Minutes   Marks: 20

Q.No.1 **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.**

S.#	Questions	A	B	C	D
1	The parametric equations $x = a \sec\theta$ and $y = b\tan\theta$ represent the equation of:	Hyperbola	Circle	Parabola	Ellipse
2	$\lim\limits_{n \to +\infty}\left(1+\frac{3}{n}\right)^{2n} =$	e	e^2	e^3	e^6
3	$\frac{d}{dx}\left(\frac{1}{x^2}\right)$ at $x = 1$ is =	-2	2	1	-1
4	$\frac{d}{dx}\left(\sin^{-1}x\right) =$	$\frac{-1}{\sqrt{1-x^2}}$	$\frac{1}{\sqrt{1+x^2}}$	$\frac{1}{\sqrt{1-x^2}}$	$\frac{-1}{\sqrt{1+x^2}}$
5	$\frac{d}{dx}(\sec^{-1}x + \mathrm{cosec}^{-1}x) =$	1	-1	0	2
6	$\frac{d}{dx}\left(5^x\right) =$	5^x	$5^x \cdot \ell n5$	$\frac{5^x}{\ell n5}$	$5(5^x)$
7	$\int\frac{d}{dx}(x^n)\,dx =$	$\frac{x^{n+1}}{n+1}+c$	$n x^{n-1}+c$	$\frac{x^{n+1}}{n}+c$	x^n+c
8	$\int\frac{\sec^2x}{\tan x}dx - \int\frac{\mathrm{cosec}^2x}{\cot x}dx =$	0	$2\ell n\tan x + c$	$2\ell n\cot x + c$	$\ell n\cot x + c$
9	$\int\sec^2x\;dx =$	$\cot x + c$	$\tan x + c$	$\sec x + c$	$\mathrm{cosec}\,x + c$
10	$\int_{-1}^{2} x\,dx =$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{3}{2}$	$-\frac{3}{2}$
11	Distance of the points (2 , 3) from y-axis is:	2	3	5	$\sqrt{13}$
12	The point of intersection of medians of a triangle is called:	Circumcenter	Orthocenter	Centroid	In-center
13	If m_1 and m_2 are slopes of two lines then lines are perpendicular if:	$m_1 m_2 = 0$	$m_1 m_2 + 1 = 0$	$m_1 m_2 - 1 = 0$	$m_1 + m_2 = 0$
14	Two lines represented by $ax^2 + 2bxy + by^2 = 0$ are orthogonal if:	$a - b = 0$	$a + b = 0$	$a + b > 0$	$a + b < 0$
15	(1 , 2) is one of the solution of inequality:	$2x + y > 5$	$2x - y \geq 5$	$2x + y < 3$	$2x + y < 5$
16	Vertex of the parabola $y^2 = 4ax$ is:	(0 , 0)	(a , 0)	(0 , a)	(a , a)
17	Vertices of $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ $a > b$ are:	$(\pm a, 0)$	$(0, \pm a)$	$(0, \pm b)$	$(\pm b, 0)$
18	The length of latus-rectum of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ is:	$\frac{b^2}{a}$	$\frac{2b^2}{a}$	$\frac{2a^2}{b}$	$\frac{a^2}{b}$
19	If any two vectors of scalar triple product are equal then its value is:	1	2	-1	0
20	The non-zero vectors '$\underline{a}$' and '$\underline{b}$' are parallel if $\underline{a} \times \underline{b} =$	0	1	-1	(a , b)

FBD-12-18

Intermediate Part Second

Roll No. ________

MATHEMATICS (Subjective)

Time: 02:30 Hours Marks: 80

SECTION – I

2. **Attempt any EIGHT parts:** 16

(i) Find gog(x) if $g(x) = \frac{3}{x-1}$, $x \neq 1$

(ii) Evaluate $\lim_{x \to 0} \frac{\sin x^0}{x}$

(iii) Find value of m so that f is continuous at x = 3 : $f(x) = \begin{cases} mx & \text{if } x < 3 \\ x^2 & \text{if } x \geq 3 \end{cases}$

(iv) Find the derivative of $y = (x^2 + 5)(x^3 + 7)$ w.r.t. 'x'

(v) Find $\frac{dy}{dx}$ if $x = at^2$, $y = 2at$

(vi) Differentiate $x^2 \sec 4x$ w.r.t. 'x'

(vii) Differentiate w.r.t. $x : \cot^{-1}\frac{x}{a}$

(viii) Find $f'(x)$ if $f(x) = e^x(1 + \ell nx)$

(ix) Find y_4 if $y = \ell n(x^2 - 9)$

(x) Define relative maxima.

(xi) If $f(x) = \frac{1}{12}x^4 - \frac{1}{6}x^3 + \frac{1}{4}x^2 + 2x + 7$, find $f^{iv}(x)$

(xii) If $y = \tan h\,(x^2)$, find $\frac{dy}{dx}$

3. **Attempt any EIGHT parts:** 16

(i) Find $\frac{dy}{dx}$ using differentials, if $x^4 + y^2 = xy^2$

(ii) Evaluate the integral $\int \frac{dx}{\sqrt{x+1} - \sqrt{x}}$

(iii) Evaluate the integral $\int \frac{dx}{x(\ell n\, 2x)^3}$

(iv) Evaluate the integral $\int x \cos x\, dx$

(v) Evaluate the integral $\int x^2 \tan^{-1} x\, dx$

(vi) Evaluate the integral $\int x^2 e^{ax}\, dx$

(vii) State the fundamental theorem of calculus.

(viii) Evaluate the definite integral $\int_2^{\sqrt{5}} x\sqrt{x^2 - 1}\, dx$

(ix) Evaluate the definite integral $\int_{-\pi}^{\pi} \sin x\, dx$

(x) Solve the differential equation $\frac{dy}{dx} = \frac{1-x}{y}$

(xi) State the linear programming theorem.

(xii) Graph the region $x - y \leq 3$; $x + 2y \leq 6$

(Continued P/2)